Transactions of the Royal Society of S. Aust. (1995), 119(1), 41-46.

SKUSEMYIA ALLOCASUARINAE, A NEW GENUS AND SPECIES OF CECIDOMYIIDAE (DIPTERA) DAMAGING LATERAL BRANCH BUDS OF DROOPING SHEOAK, *ALLOCASUARINA VERTICILLATA* IN AUSTRALIA

by P. KOLESIK*

Summary

KOLESIK, P. (1995). *Skusemyia allocasuarinae*, a new genus and species of Cecidomyiidae (Diptera) damaging lateral branch buds of drooping sheoak, *Allocasuarina verticillata* in Australia. *Trans. R. Soc. S. Aust.* 119(1), 41-46, 31 May, 1995.

A new gall midge genus *Skusemyia* and a new species *S. allocasuarinae* are described from South Australia. Detailed descriptions of the larva, pupa, male and female of the new species as well as its gall on drooping sheoak, *Allocasuarina verticillata*, are given. The new genus is placed in the subtribe Schizomyiina within the tribe Asphondyliini.

KEY WORDS: Cecidomyiidae, Cecidomyiinae, Cecidomyiidi, Asphondyliini, Schizomyiina, *Skusemyia* gen. nov., *Skusemyia allocasuarinae* sp. nov., *Allocasuarina verticillata*, South Australia.

Introduction

This paper is the second part of a study on the South Australian Cecidomyiidae. Kolesik (in press) described the first South Australian gall midge species, *Eocinctiomyia malarskii*, from *Eucalyptus fasciculosa*. A new species is described here that was found damaging the lateral branch buds of drooping sheoak, *Allocasuarina verticillata* (Lam.) L. Johnson (Casuarinaceae) in South Australia. The large numbers of infested and ultimately killed branch buds at one site indicate that this species could become a serious pest (Fig. 3I). The new gall midge has one generation per year in Adelaide, South Australia.

A new genus is erected for the new species. It belongs to the subfamily Cecidomyiinae and supertribe Cecidomyiidi. It is compared to other known genera of the subtribe Schizomyiina of the tribe Asphondyliini.

Materials and Methods

A survey of the Cecidomyiidae associated with galls on plants in nature conservation parks around Adelaide was carried out between November 1992 and May 1993. All galls sampled were dissected and examined. Those which contained larvae of Cecidomyiidae were described, photographed and conserved for later authoritative identification of the host plant species. The larvae from the gall kind described here were processed in two ways. A small number was preserved in 70% ethanol after notes were made on their colour. The larger number was brought to the laboratory to rear to adults. Here the galls were carefully dissected and the larvae transferred with entomological tweezers into rearing pots containing sterilised, wet sand (Skuhravá & Skuhravý 1960). Pots were examined daily and emerged adults preserved together with their pupal skins in 70% ethanol after their colour had been noted. Microscope mounts of a series were prepared by maceration in 20% KOH, followed by processing through distilled water, 70 and 99% ethanol and xylene to Canada balsam mountant for examination by interference-contrast and bright-light microscopy. Larvae, entire or dissected into two pieces, and entire pupae, were mounted dorso-ventrally or laterally. Adults were dissected into four (female) or five (male) pieces and the particular parts were mounted separately. Wing and head were mounted frontally, thorax laterally, abdomen dorso-ventrally or laterally and male genitalia dorso-ventrally. Measurements were made with an eyepiece reticule. Drawings were done with the aid of a camera lucida. The type series and other material retained in 70% ethanol are deposited in the South Australian Museum, Adelaide [SAM] and United States National Museum, Washington [USNM].

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Genus ***Skusemyia*** gen. nov.

Adult

Wings with R_5 joining C at wing apex, Rs weak, R_1 joining C near wing mid-length, M_{1+2} absent, M_3 weakly developed, Cu forked. Maxillary palpus with 4 segments. Male antenna with 12 flagellomeres. Female antenna with 11 flagellomeres, the last three successively and progressively shorter, the last apparent flagellomere evidently a combination of the eleventh and twelfth. Flagellomeres cylindrical with necks, first and second not fused, with long and stout setae in two whorls, bearing closely appressed circumfila. Tarsi with first segment substantially shorter than the second.

first tarsomeres lacking ventrodistal spine, tarsal claws simple, empodia much shorter than claws. Male terminalia: gonocoxites free ventrally, produced to form a roundly triangular apical process; gonostylus situated dorsally on gonocoxite, short and wide, with truncated apex bearing teeth of uniform length; cerci simple, rounded apically; hypoproct divided into two apical lobes; claspettes large; aedeagus long, stout, tapering distally. Female abdominal sternite 7 longer than sternite 6. Ovipositor: protractile, elongate, sclerotized, without basal lobes; cerci fused, divided at apex, setose.

Larva

Head capsule with short posterolateral apodemes. Antenna short. Sternal spatula bilobate. Anus ventral. Thoracic and first through seventh abdominal segments with 6 dorsal, 2 pleural and 4 ventral papillae. Eighth abdominal segment with 2 dorsal, 2 pleural and 2 ventral papillae. Terminal segment with 8 dorsal and 4 anal papillae. All collar, thoracic and abdominal papillae asetose with exception of the dorsal papillae on the terminal segment that are bearing very short setae.

Pupa

Frons without projections. One of three lower facial papillae with a seta. Lateral facial papillae absent. Cephalic sclerite with two strongly chitinized swellings and two papillae with long setae. First through seventh abdominal segments with 6 dorsal asetose papillae and one pleural setose papilla. Second through eighth abdominal segments dorsally with 3 indistinct transverse rows of spines on anterior half. Last abdominal segment with large pouch, emarginate medially but not completely divided in two parts.

Type species: *Skusemyia allocasuarinae* sp. nov.

Etymology

The genus is named after E.A.A. Skuse, author in 1888/1890 of the first taxonomic studies on Australian Cecidomyiidae.

Remarks

Skusemyia fits in the tribe Asphondyliini of the supertribe Cecidomyiidi because the female seventh abdominal sternite is 1.5 times as long as the sixth sternite and the eighth tergite is wider than the seventh tergite, combined with the male genitalia having a ventroapical gonocoxal lobe and a dorsally situated gonostylus that is about as broad as long; it belongs to the subtribe Schizomyiina because the first tarsomeres lack a ventrodistal spine, the male genitalia have claspettes, and the female lacks cerci-like lobes immediately posterior to the eighth tergite (Gagné 1994). Within the subtribe Schizomyiina, *Skusemyia* resembles most closely *Placochela* Rubsaamen, known from three European and one El Salvadorean species (Möhn 1960, Skuhravá 1986). The male antennae of the two genera are the only ones in the subtribe with relatively simple circumfila and with flagellomeres made up of a bulbous basal node and long neck and resembling those of *Dasineura* and relatives (Oligotrophini: Lasiopteridi). The female antennae of *Skusemyia* and *Placochela* are also similar except that the eleventh and twelfth flagellomeres of the new genus are apparently amalgamated, which is unique in Asphondyliini. The genitalia of both sexes are generally similar also (Möhn 1961), except in details of the ovipositor, which differs in *Skusemyia* because the cerci are discrete, at least at their apices, and the distal setae are longer. The immature stages of *Skusemyia* are unique in Schizomyiina. The pupal cephalic sclerite has two swellings that are longer than the antennal horns. The larva has very reduced papillar setae, and the papillae of the terminal segment are all situated at the end of separate lobes.

Skusemyia allocasuarinae sp. nov.
FIGS 1-3

Holotype: ♂, Black Hill Conservation Park, South Australia [34°53'S., 138°44'E.], 15.iii.1993, P. Kolesík, reared from larva from lateral branch bud gall of *Allocasuarina verticillata* (Lam.) L. Johnson, sampled 25.ii.1993, 121270 [SAM].

Allotype: ♀, same data but emerged 16.iii.1993, [2127] [SAM].

Paratypes (all sampled with holotype): 4♂♂ and 4♀♀, emerged 13-19.iii.1993; 7 pupae, emerged 13-18.iii.1993; 8 larvae [SAM].

Other material: 4♂♂, 3♀♀ [SAM], 3♂♂, 3♀♀ [USNM], 3 pupae [SAM] and 3 pupae [USNM], same data as holotype but emerged 16-22.iii.1993; 6 [SAM] and 3 larvae [USNM], same data but sampled 25.iii.1993; 3 larvae, Wistow, South Australia [35°07'S., 138°53'E.], 23.iii.1993, P. Kolesík, on *A. verticillata*.

Description

Male (Fig 1)

Colour: antenna grey, head black, thorax brown, abdomen with sclerotized parts black and non-sclerotized red, legs yellow, all setae black. Total length of the body 3.24 mm (range 3.15 - 3.33 mm). Wing length 2.44 mm (2.33 - 2.52), width 0.98 mm (0.93 - 1.00). Wing membrane and especially veins densely covered with setae, 50 - 60 μm. Antenna total length 1.72 mm (1.57 - 1.83); flagellomeres with stout setae, 54 - 160 μm, longer at the distal whorl than at the basal whorl; closely appressed circumfila consisting of one transverse and one longitudinal bands. Eye bridge 5 to 6 facets medially, eye facets rounded. Claws curved beyond the second third, 39 μm (37 - 41). Empodium 11 μm (8 - 16).

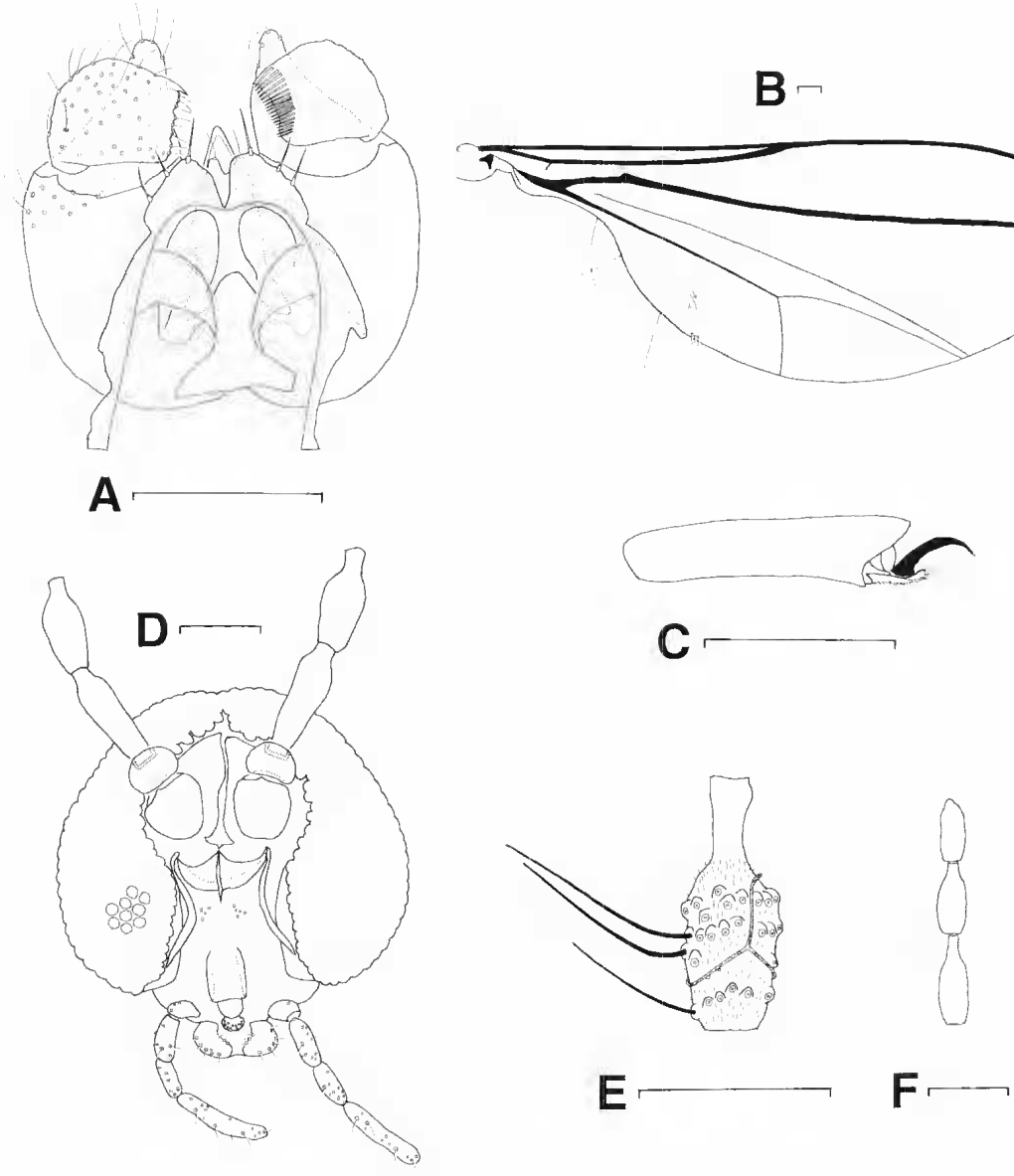

Fig. 1. Male of *Skusemyia allocasuarinae* gen. et sp. nov.: A. genitalia in dorsal view; B. wing; C. last tarsal segment with claw and empodium; D. head in frontal view; E. sixth flagellomere; F. last three flagellomeres. Scale bars = 100 μm.

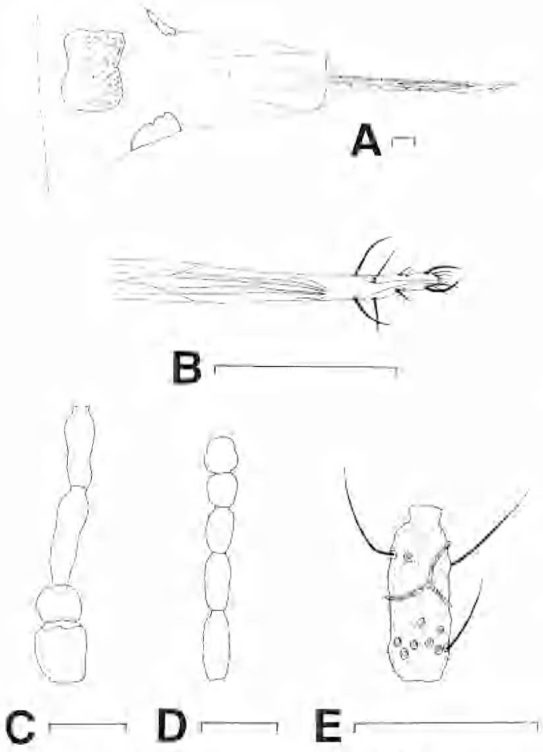

Fig. 2. Female of *Skusemyia allocasuarinae* gen. et sp. nov.: A, ovipositor in ventral view; B, end of ovipositor in ventral view; C, first four antennal segments; D, last five flagellomeres; E, sixth flagellomere. Scale bars = 100 μm.

Terminalia: gonocoxite setose and setulose; gonostylus setose and setulose, bearing 17 - 20 sclerotized tapering teeth that are narrow and about 15 μm in length; hypoproct bearing one seta on each lobe, setulose; cerci deeply divided medially, setose and setulose; claspettes setulose.

Female (Fig. 2)

Total length of the body 3.63 mm (3.41 - 3.80). Wing length 2.65 mm (2.32 - 2.80), width 0.89 mm (0.74 - 1.00). Antenna total length 1.12 mm (0.95 - 1.20); flagellomeres with setae, 51 - 115 μm. Last flagellomere with a shallow constriction medially. Seventh abdominal sternite about 1.5 times longer than sternite 6. Ovipositor with one ventral sclerotized longitudinal band forked distally, distal half of ovipositor with 8 - 9 pairs of 6 - 9 μm long setae, cercus with 8 pairs of 5 - 48 μm long setae. Colour and other characters as in male.

Mature larva (Fig. 3A-D)

Colour red. Total length 3.70 mm (3.24 - 4.44). Integument smooth, ventrally with several transverse rows of spiculae on anterior half of each segment. Head capsule width 61 μm (53 - 77), length 63 μm (51 - 74), length of posterolateral apodemes 61 μm (51 - 64). Antenna 17 μm (15 - 20). Sternal spatula 268 μm (230 - 320) in length, with apical enlargement 86 μm (77 - 105) in width and 42 μm (38 - 51) in length. Terminal segment dorsally with 8 lobes bearing papillae: 6 with very short setae and 2 with corniform setae.

Pupa (Fig. 3E-H)

Colour: prothoracic spiracle, cephalic swellings and antennal horns dark brown, remaining parts pale brown. Total length 3.03 mm (2.46 - 3.56). Integument covered with spiculae, ventrally 2 - 4 μm and dorsally 4 - 6 μm long. Antennal horns 33 μm (28 - 38) long. Cephalic swellings 77 μm (74 - 80) in length. Cephalic papilla with seta 76 μm (58 - 90). One of three lower facial papillae with seta 45 μm (38 - 51). Prothoracic spiracle 146 μm (140 - 151) long and 23 μm (20 - 28) wide across the base, with trachea ending at apex. Seta on pleural papilla 9 μm (8 - 10). Dorsal spines of the first row 13 - 20 in number, 5 - 30 μm; spines of the second row 13 - 20 in number, 25 - 45 μm; spines of the third row 9 - 12 in number, 35 - 65 μm.

Gall (Fig. 3I)

Swollen lateral branch bud, forming spherical to spindleform rosette, 7 - 12 mm in diameter, polythalamous, pale brown in colour. One larva in each of the 2 - 3 cells. Galls appear in January - March. Larvae leave galls to pupate in the soil.

Etymology

Derived from the generic name of the host plant.

Acknowledgments

I thank the South Australian Museum, Division of Natural Science, for providing the facilities that assisted this work. I am grateful to the museum collaborators Ms J. A. Forrest, Dr E. G. Matthews and Mr D. B. Hirst for their support. The Ministry of Environment and Planning, South Australia, kindly gave permission to collect in the nature conservation parks of Black Hill, Morialta and Cleland. I wish to thank Mr M. C. O'Leary, State Herbarium of South Australia, Adelaide, for the identification of the host plant species. I am grateful to Dr Raymond J. Gagné, Systematic Entomology Laboratory, U.S. National Museum, Washington, for careful review of the manuscript.

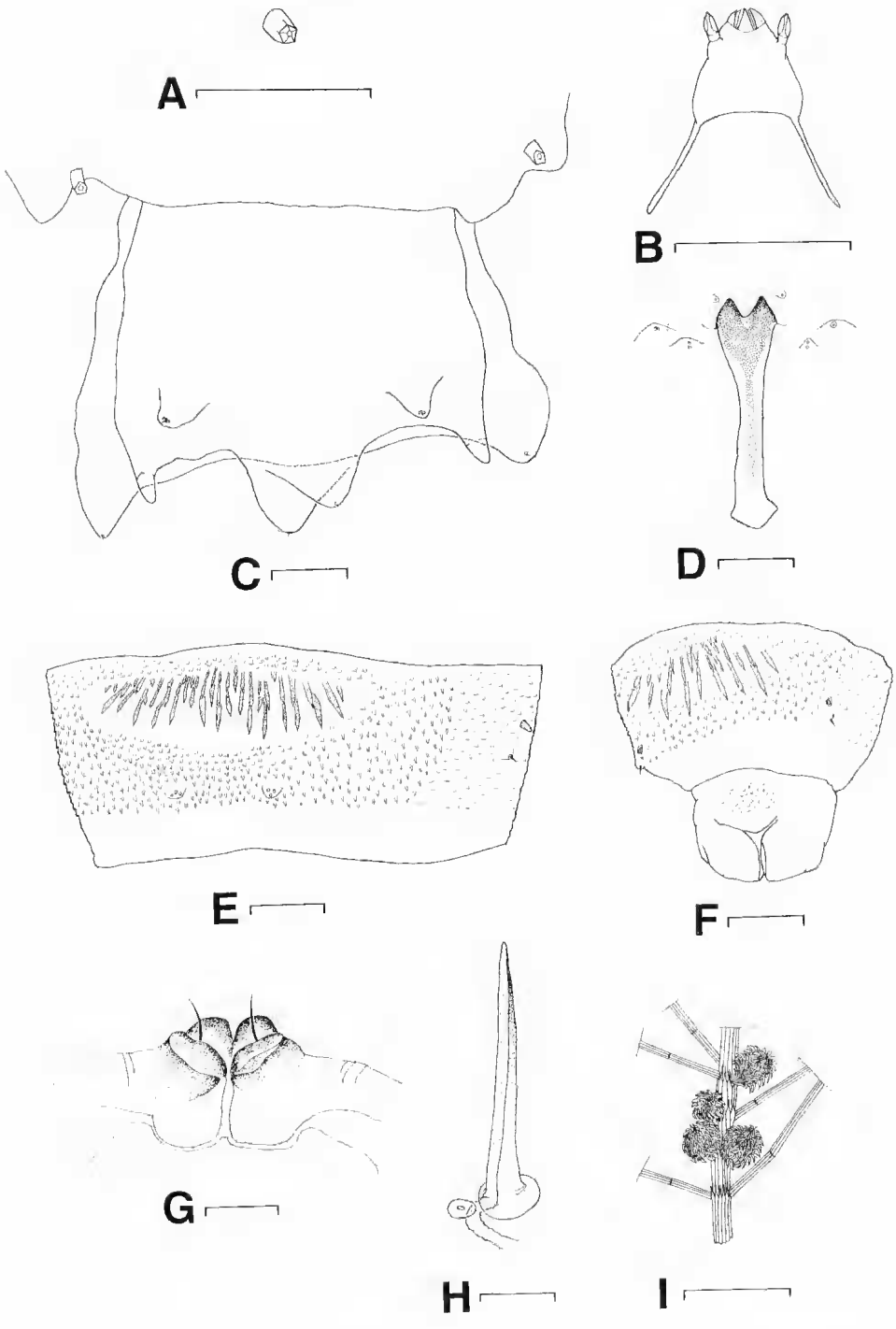

Fig. 3. *Skusemyia allocasuarinae* gen. et sp. nov.: A. - D. larva; E. - H. pupa; I. gall. A. stigma; B. head capsule in dorsal view; C. anal segment in dorsal view; D. sternal spatula; E. sixth abdominal segment in dorsal view; F. last abdominal segment in dorsal view; G. anterior end in ventral view; H. prothoracic spiracle; I. *Allocasuarina verticillata* - lateral branch bud galls caused by *Skusemyia allocasuarinae* gen. et sp. nov. Scale bars = 100 μm. A. - H.; 2 cm I.

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